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Published in:
International Journal of Drug Policy

Publication date:
2010

Document Version
Publisher's PDF, also known as Version of record

International Journal of Drug Policy 21 (2010) 247–250

Contents lists available at ScienceDirect

International Journal of Drug Policy

journal homepage: www.elsevier.com/locate/drugpo

Short report

The reach of a free hepatitis B vaccination programme: Results of a Dutch study among drug users

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ARTICLE INFO

Article history:
Received 26 February 2009
Received in revised form 10 June 2009
Accepted 9 July 2009

Keywords:
Hepatitis B
Vaccination
Drug users
Demographic and behavioural factors

ABSTRACT

Background: The objective of the study was to explore the reach of an ongoing hepatitis B vaccination programme in terms of awareness of the programme among drug users (DUs), vaccination uptake and compliance, as well as to investigate reasons for non-participation.
Methods: Ethnographic mapping and targeted sampling were used to recruit 309 DUs in three regions in the Netherlands. Results were based on univariate statistics (Chi-square and *t*-tests) and multivariate logistic regression analysis.
Results: Of the sample, 63% were aware of the free vaccine, and 44% said they had been vaccinated. DUs who visited drug consumption rooms were more likely to be aware of the programme than those who did not. Vaccination uptake was negatively associated with older age of onset of drug use. Uptake was positively associated with being informed personally about the free vaccination by drug service staff. A history of STD infection, and having sexual intercourse with casual partners were negatively associated with compliance with the vaccination schedule (receiving three vaccinations).
Conclusion: Our results suggest that marginalised DUs have been reached by the programme. Attention should be paid to those at risk of hepatitis B infection through sexual contacts, since they are less likely to be fully vaccinated. Most importantly, our results suggest that immediate vaccination on location after personal communication is one of the most effective ways to increase vaccination uptake.

Introduction

Hepatitis B is a major public health problem among drug users (DUs). In 2004–2005 prevalence rates of previous infection of over 40% were reported among injecting drug users in six different European countries (Vincente & Wiessing, 2007). Immunisation of this group is very important. The Netherlands does not have a universal hepatitis B vaccination programme, but a policy of targeting certain 'high risk' groups. After a successful pilot (Van Steenbergen, 2002) a nationwide vaccination programme started in 2002 to increase the number of DUs with immunity against hepatitis B virus (Waldhober & Heijnen, 2003).

As part of this programme, Public Health Services (PHS) have been collaborating with drug services, needle exchanges, methadone programmes, homeless shelters, and prisons (enhanced outreach) (Heijnen et al., 2004). Participants are tested for markers of current or past infection with the hepatitis B virus when receiving the first dose of the 3-dose hepatitis B vaccination. Those susceptible for hepatitis B are encouraged to adhere to the 6-month vaccination schedule; and are given an incentive (pocket radio) to finish the programme.

In order to examine if the target group was adequately reached by the hepatitis B vaccination programme, we investigated the proportion and characteristics of DUs who were aware of the free hepatitis B vaccination, of those who were vaccinated by the programme, and who complied with the vaccination schedule. In addition, reasons for refusing the vaccine were assessed.

Materials and methods

Procedure

Interviews were conducted between February and December 2005 in three intervention regions: Rotterdam, Utrecht and South Limburg. These areas were chosen on the basis of ethnographic mapping (Baars, Boon, Garretsen, & Van de Mheen, 2009; Watters & Biernacki, 1989). The mapping included conducting interviews with key figures and undertaking observation to map all locations

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doi:10.1016/j.drugpo.2009.07.001

Table 1
Proportions and mean scores (SD) of characteristics for those aware or unaware of the possibility to obtain free hepatitis B vaccination.

Characteristics		Total, *n* (%)	Proportions/mean (SD)		Characteristics		Total, *n* (%)	Proportions/mean (SD)	
			Aware	Unaware				Aware	Unaware
Demographic variables					*Sexual behaviour*				
Rotterdam (ref)		103 (33)	70	30	Intercourse with steady sex partner (past 6 months)	Yes	94 (31)	57	43
Utrecht*		105 (34)	67	33		No	213 (69)	65	35
Limburg*		101 (33)	52	48					
Male		241 (78)	61	39	Inconsistent condom use with steady sex partner (past 6 months)	Yes	85 (90)	59	41
Female		68 (22)	68	32		No	9 (10)	44	56
Living with partner	Yes	48 (16)	71	29	Intercourse with casual sex partner(s) (past 6 months)	Yes	83 (27)	59	41
	No	260 (84)	61	39		No	225 (73)	64	36
Homeless*	Yes	134 (43)	69	31	Inconsistent condom use with casual sex partner(s) (past 6 months)	Yes	42 (51)	55	45
	No	175 (57)	58	42		No	41 (49)	63	37
Religious	Yes	204 (66)	63	37	No. of casual sex partners (past 6 months)	(*t*-test)	83	2.78 (2.18)	2.86 (3.50)
	No	105 (34)	62	38					
Low educational level (≤primary school)	Yes	110 (64)	61	39	Being paid for sex (past 6 months)	Yes	30 (10)	67	33
	No	199 (36)	64	36		No	262 (90)	63	37
Dutch ethnicity	Yes	144 (47)	55	45	Having paid for sex (past 6 months)	Yes	16 (5)	62	38
	No	164 (53)	70	31		No	289 (95)	63	37
Age	(*t*-test)	309	41.75 (7.36)	41.57 (7.56)	Lifetime history of STD-infection	Yes	115 (37)	61	39
						No	193 (63)	64	36
Drug use					*Use of facilities in the past 6 months*				
Heroin (past 6 months)	Daily		65	35	Day shelter	Yes	118 (39)	66	34
	<Daily		60	40		No	182 (61)	61	39
Base coke/crack (past 6 months)	Daily	125 (41)	66	34	Night shelter*	Yes	95 (32)	72	28
	<Daily	181 (59)	60	40		No	206 (68)	59	41
Ever injecting drugs	Yes	137 (45)	59	41	Drug consumption room**	Yes	125 (41)	74	26
	No	170 (55)	66	34		No	180 (59)	56	44
Ever shared needle	Yes	58 (43)	57	43	Methadone program	Yes	192 (63)	64	36
	No	78 (57)	60	40		No	115 (37)	60	40
Injecting drugs (past 6 months)	Yes	61 (20)	56	44	Imprisonment	Yes	99 (32)	67	33
	No	245 (80)	65	35		No	210 (68)	61	39
Age onset of drug use*	(*t*-test)	306	22.10 (7.18)	20.16 (6.25)					

* $p \leq 0.05$.
** $p < 0.01$.

where DUs gathered (for example street locations, drug services, methadone outlets, and homeless shelters). The interviewers visited the recruitment sites a number of times at different times of the day to recruit DUs (comparable to the method of time-location sampling; Muhib et al., 2001). They were informed about the nature of the questions to be asked, the amount of time the interview would take, and the fact that the study was anonymous. After completing the interview, respondents received 5 euros.

Study eligibility criteria included being a current chronic[1] user of heroin, base coke/crack, amphetamine and methadone. A total of 309 DUs were interviewed (response rate: 83%), of which 45% had ever injected drugs, and 20% had been injecting in the past 6 months (Table 1).

Measures

Awareness of the programme was measured by asking participants whether and how they knew the hepatitis B vaccination was free of charge for them. They were also asked about their hepatitis B vaccination status, the vaccination location, and hepatitis B virus infection. Associations between demographics, sexual behaviour, drug use, the use of drug services (Table 1), and the outcome variables (awareness of the free hepatitis B vaccination, vaccination uptake, and compliance with the vaccination schedule) were analysed using univariate statistics (Chi-square and Student's *t*-test). Variables associated at $\alpha = 0.1$ level were included in multivariate

[1] Respondents were recruited for participation in the study if they were habitual users of illicit drugs (no recreational drug use).

hierarchic logistic regression analyses. Region was controlled for in these regression analyses.

Results

Awareness of free hepatitis B vaccination

Approximately two-thirds of DUs (62.8%, $n = 194$) were aware of the free hepatitis B vaccination. Of those, 58% had been informed by drug service staff, 16% by staff of PHSs, 12% had seen a flyer, 9% had seen a poster, and 10% were informed by friends (multiple answers possible).

Table 1 shows that region, homelessness, age at onset of drug use, and visiting night shelters and/or drug consumption rooms in the past 6 months were associated with awareness. In addition, those DUs who had most frequently visited night shelters or drug consumption rooms in the past 6 months were more likely to be aware of the programme ($p = 0.02$ and 0.003). Visiting drug consumption rooms in the past 6 months was the only variable that remained significantly associated with awareness in a multivariate regression analysis (OR = 1.86, CI: 1.04, 3.33).

Hepatitis B vaccination uptake

In our sample ($n = 309$), 43.7% ($n = 135$) reported that they were vaccinated against hepatitis B (1 or more vaccinations), and 41.8% that they had been vaccinated through the programme. The majority had (78.2%) received their first injection at an outreach location (for example a methadone outlet). The prevalence of self-reported hepatitis B virus infection was 21.9%.

Univariate analyses among those DUs who were aware of the programme and who reported not to be infected, nor to have been vaccinated outside the programme ($n = 140$) showed that the vaccination rate was highest in the region of Rotterdam (74.1% vs 52.6% in Utrecht vs 65.5% in South Limburg; $p = 0.06$). Uptake was greater among women than men (80.6% vs 58.7%; $p = 0.03$), and age at onset of drug use was lower among DUs who obtained vaccinations (21.86 years (SD = 7.91) vs 24.14 years (SD = 6.53); $p = 0.09$). No other significant associations with vaccination uptake were found for the variables shown in Table 1. An additional analysis found a higher proportion of those informed about the free vaccine by drug service staff were vaccinated compared to those informed through PHS, flyers, posters or friends (71.6% vs 52.3%; $p = 0.02$).

Age of onset of drug use (OR = 0.94, CI: 0.89, 0.99) as well as being informed about the vaccination programme by drug service staff (OR = 2.13, CI: 1.00, 4.53) were significant predictors of hepatitis B vaccination uptake in a multivariate analysis.

Barriers to uptake were: not thinking of obtaining a vaccination, not perceiving a risk of Hepatitis B infection and not finding a convenient moment and/or not having time to obtain the vaccination.

Compliance with the hepatitis B vaccination schedule

Of DUs who were vaccinated at least 6 months prior to the interview and thus had the opportunity to be fully vaccinated ($n = 60$), 66.7% received three vaccinations or more. Univariate analyses showed that compliance rates in South Limburg were higher than in Rotterdam and Utrecht (94.1% vs 53.8% vs 58.8%; $p = 0.02$). Compliance was positively associated with ever injecting drug use (79.2% vs 58.3%; $p = 0.09$), and negatively with having intercourse with casual sex partners (42.1% vs 78.0%; $p = 0.006$), as well as history of STD-infection (41.7% vs 83.3%; $p = 0.001$). A final multivariate analysis showed DUs who completed the schedule were less likely to report intercourse with casual sex partners (OR = 0.15, CI: 0.04, 0.76) or have a history of STD infection (OR = 0.14, CI: 0.04, 0.55) than those who did not obtain full vaccination.

Discussion

Our results reveal that almost two-thirds of DUs (62.8%) have been reached by the hepatitis B vaccination programme: they were aware that they could opt for free vaccination. Visiting drug consumption rooms was the most important predictor of awareness. Moreover, 41.8% of DUs in our study obtained a vaccination through the programme. DUs who started drug use at a younger age were more likely to be vaccinated, as well as those who had been informed about the free vaccine by drug service staff compared to those informed by staff of PHS, flyers, posters or friends. By receiving three or more injections, 66.7% of DUs who obtained vaccination complied with the vaccination schedule. History of sexual intercourse with casual partners in the last 6 months and history of STD infections were associated with poorer compliance.

There are several shortcomings of the study to address. First, an incentive for taking part in a survey may induce low-income groups and DUs craving for drugs to participate. Second, the accuracy and therefore validity of self-reported data among DUs has been debated (Best et al., 1999; Kuo, Mudrick, Strathdee, Thomas, & Sherman, 2004; Langendam, Van Haastrecht, & Van Ameijden, 1999; Schlicting et al., 2003). However, serologic tests have limitations too; since they are invasive they may increase refusal rates (Fishbein & Pequegnat, 2000).

In accordance with the outreaching nature of the vaccination programme, our results showed that those DUs who had visited drug consumption rooms were more likely to be aware of the free vaccine. The groups who have been reached by the programme are probably the most marginalised groups, since those visiting drug consumption rooms are usually homeless and frequent users of cocaine and/or heroin. Homeless DUs regularly visit low-threshold facilities in which the free hepatitis B vaccination programme has been implemented, and thus have a higher chance to be aware of the programme. Reasons for non-participation (such as not having enough time to be vaccinated and/or finding obtaining the vaccination to be inconvenient) support the finding that convenience is related to vaccination uptake (Campbell et al., 2007; Des Jarlais et al., 2001). In addition to these findings, we show that personal communication about the free vaccination by drug service staff is associated with vaccination uptake and seems more efficient than posters or flyers. Since most DUs were vaccinated on location (such as in drug consumption rooms), our results suggest that immediate vaccination after personal communication is one of the most effective ways to increase vaccination uptake.

The study also showed that sexually active DUs and those with a history of STD-infection (a group at risk for hepatitis B virus infection through sexual transmission, taking into account the high number of DUs who had unprotected sex, as shown in Table 1), are less likely to be fully vaccinated. This highlights the need to stimulate compliance with the full vaccination schedule, especially among those at greatest risk: injectors and those with multiple sexual partners.

Acknowledgements

This study was funded by the Netherlands Organization for Health Research and Development (grant number 2500.0011) and the Netherlands Association for Community Health Services.

Conflict of interest statement

None declared.

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